

REMARKS

This Reply is in response to the Office Action mailed on April 18, 2005 in which Claims 1-8 were rejected. With this response, Claim 8 is cancelled and Claims 9-20 are added. Claims 1-7 and 9-20 are presented for reconsideration and allowance.

I. Objection to the Disclosure.

Paragraph 3 of the Office Action objected to the disclosure noting several informalities. In response, the disclosure is amended as suggested in the Office Action. Applicant respectfully notes, however, that the suggested phrase “, now U.S. Patent No. 6,629,452,” was correctly inserted after the date “2002” rather than “2000”. Applicant respectfully requests that the objection to the disclosure be withdrawn in light of such amendments.

II. Rejection of Claims 1-8 Under 35 U.S.C. § 103 Based Upon Jackson and Watanabe.

Paragraph 5 of the Office Action rejected Claims 1-8 under 35 U.S.C. § 103 as being unpatentable over Jackson et al., U.S. Patent No. 5,934,140, in view of Watanabe et al., JP 63-62752. Claim 8 is cancelled. Based on the remarks which follow, Applicant respectfully requests that the rejection of Claims 1-7 be withdrawn.

Claim 1 is amended to replace “paper”, which was believed to be unduly and unnecessarily limiting, to “medium.” Claim 1 recites a printing device which includes a surface-engaging member, a reflective member joined to the surface-engaging member, one or more light sources configured to project light energy toward the reflective member and a position detector configured to receive light energy that is reflected from the reflective member. The surface-engaging member is configured for displacement by the medium’s surface in accordance with variations in roughness of the surface sufficiently so that light that is reflected by the reflective member and received by the position detector can be utilized to ascertain or measure of the medium surface’s roughness.

Claim 6 is amended to replace “paper” which is believed to be unnecessary and unduly limiting with “medium”. Claim 6 recites a method of detecting the roughness of a medium surface which includes engaging a medium surface with a surface-engaging member, projecting light energy towards a reflective member associated with the surface-engaging member, receiving light energy that is reflected by the reflective member, and ascertaining, from the received light energy, a roughness measurement.

Neither Jackson nor Watanabe, alone or in combination, disclose or suggest a print device or a method in which roughness of a medium surface is measured or ascertained by sensing movement of light that has been reflected off of a reflective member associated with a surface-engaging member which moves as a result of variations in the profile or roughness of the surface. In contrast, Jackson merely discloses one embodiment 110a which utilizes a light-emitting diode 120 and a position detector 122 to measure a thickness or a curl of a sheet. Nowhere does Jackson disclose or even suggest that light-emitting diode 120, position detector 122 and sensor arm 112 may alternatively be used to measure surface roughness. In fact, although Jackson discloses no less than 13 different embodiments for measuring paper properties, not one of these embodiments is disclosed for the purpose of measuring surface roughness.

Like Jackson, Watanabe also fails to disclose measuring or otherwise detecting variations in surface roughness by reflecting a light off of a reflective member associated with a surface-engaging member, and detecting movement of the light which occurs in response to movement of a surface-engaging member as a result of variations in surface roughness. In contrast, Watanabe merely discloses a pick-up 11 which is physically connected to a stylus 10, wherein the pick-up 11 converts movement of the stylus 10 into an electrical current that is amplified and processed and is used to adjust ink applied to the paper by thermal head 3. Nowhere does Watanabe disclose or suggest sensing a surface roughness by reflecting light off of a reflective member associated with a surface-engaging

member and detecting movement of the light which corresponds to variations in the profile of the surface.

In rejecting Claims 1-7, the Office Action asserts that:

modifying the flat end of the sensor utilizing Jackson et al. with a probe tip as shown in Watanabe et al. would have been obvious to one of ordinary skill in the art as a means to more accurately detect the surface texture of the print media as a means of ensuring high grade printing.

However, this assertion seems to overlook the fact that, regardless of the probe tip being utilized, neither Jackson nor Watanabe disclose measuring or detecting a roughness of a surface by sensing movement of light reflected off of a reflective member associated with a surface-engaging member that moves or modulates in response to variations in surface roughness.

Neither Jackson nor Watanabe provide any motivation or suggestion for their modification based upon the teachings of the other. As noted above, Jackson discloses multiple paper property sensors specifically configured to sense particular paper properties. Watanabe merely adds another type of paper property sensor configured for specifically measuring surface roughness. Nowhere does Jackson disclose or suggest that its one embodiment 110a that actually detects light from an LED 120 deflected by sensor arm 112 may be used for anything but sensing sheet thickness and curl. To the best of Applicant's understanding of Watanabe based upon its English abstract, nowhere does Watanabe disclose or suggest that surface roughness may be measured by alternatively sensing movement of light reflected off of a reflector associated with its stylus 10. Since neither Jackson nor Watanabe even recognized that surface roughness may be measured or ascertained by reflecting light off of a reflective member associated with a surface-engaging member, it would not be obvious to one of ordinary skill in the art to modify either Jackson or Watanabe to specifically configure or calibrate position detector 122 of Jackson to be sensitive to the relative small movement of light that occurs in response to variations in surface roughness. Any such assertion to this effect would

appear to be using Applicant's own disclosure as a blueprint and to be based upon impermissible hindsight reasoning. Accordingly, the rejection of Claims 1-7 based upon Jackson and Watanabe is improper and should be withdrawn.

III. Added Claims.

With this response, Claims 9-20 are added. Claims 9-20 recite additional features which are believed to be patentably distinct over the prior art of record.

A. Claims 9 and 13.

Claims 9 and 13 depend from Claims 1 and 7 and further recite that the light projected towards the reflective member comprises visual light. Claims 9 and 13 are believed to be patentably distinct over the prior art of record for the same reasons discussed above with respect to Claims 1 and 7.

B. Claims 10, 11 and 14.

Added Claims 10, 11 and 14 recite that the print parameters that are modulated in accordance with the measure of the medium surfaces roughness are selected from a group of parameters consisting of fuser temperature, fusing time, fusing speed, toner concentration, toner development voltage, transfer device voltage or photosensitive charging device voltage. The prior art of record fails to disclose or suggest modulating any of such parameters based upon measurement of the surface roughness. For example, Watanabe merely discloses a printer that deposits ink upon a medium rather than toner. Watanabe fails to disclose or even recognize that parameters associated with electro photographic printers, such as the claimed parameters, may also be beneficially adjusted based upon a measured surface roughness.

C. Claims 15-20.

Added Claim 15 recites a surface roughness detection device which includes a surfacing engaging member, an electromagnetic source configured to project electromagnetic energy towards the surface-engaging member and a sensor

configured to receive electromagnetic energy reflected from the surfacing-engaging member and to detect movement of the reflected electromagnetic energy to ascertain a measure of surface roughness of the medium. The prior art of record, including Jackson and Watanabe, fails to disclose a surface roughness detection device which detects roughness of a surface by sensing movement of electromagnetic radiation that has been reflected off of a surfacing-engaging member. Thus, added Claim 15 is believed to be patentably distinct over the prior art of record. Claims 16-20 depend from Claim 15 and recite additional features which are further believed to be patentably distinct over the prior art of record.

III. Conclusion.

After amending the claims as set forth above, claims 1-3 and 6-7, are now pending in this application.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 08-2025. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 08-2025. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 08-2025.

Respectfully submitted,

Date July 18, 2005

By Todd A. Rathe

FOLEY & LARDNER LLP
Customer Number: 22879
Telephone: (414) 297-5710
Facsimile: (414) 297-4900

Todd A. Rathe
Attorney for Applicant
Registration No. 38,276